

<u>L12</u>	(handheld or portable).ab. and (display\$ with happy with face\$)	6	<u>L12</u>
<u>L11</u>	(handheld or portable) and (display\$ with happy with face\$)	8	<u>L11</u>
<u>L10</u>	(handheld or portable) and (display\$ with hayyp with face\$)	0	<u>L10</u>
<u>L9</u>	(handheld or portable) and (display\$ with face\$)	3536	<u>L9</u>
<u>L8</u>	L7 and (portable or handheld)	0	<u>L8</u>
<u>L7</u>	L5 or 5974262.pn.	2	<u>L7</u>
<u>L6</u>	L5 and 5974262.pn.	0	<u>L6</u>
<u>L5</u>	6035304.pn.	1	<u>L5</u>
<u>L4</u>	(computer same (display\$ with (happy adj1 face\$) and condition\$))	4	<u>L4</u>
<u>L3</u>	(computer with display\$ with (happy adj1 face\$) and condition\$)	1	<u>L3</u>
<u>L2</u>	(computer and display\$ and (happy adj1 face\$) and condition\$)	35	<u>L2</u>
<u>L1</u>	(computer and display\$ and (happy adj1 face\$) and condition\$).ab.	0	<u>L1</u>

END OF SEARCH HISTORY

L12/6 up till

Portable Device
with
happy face.

approx ~~most~~ condition
of the word.

Refine Search

Search Results -

Term	Documents
PORTABLE	149122
PORTABLES	547
HANDHELD	9789
HANDHELDS	70
(7 AND (HANDHELD OR PORTABLE)).USPT.	0
(L7 AND (PORTABLE OR HANDHELD)).USPT.	0

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<u>L8</u>	L7 and (portable or handheld)	0	<u>L8</u>
<u>L7</u>	L5 or 5974262.pn.	2	<u>L7</u>
<u>L6</u>	L5 and 5974262.pn.	0	<u>L6</u>
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<u>L2</u>	(computer and display\$ and (happy adj1 face\$) and condition\$)	35	<u>L2</u>
<u>L1</u>	(computer and display\$ and (happy adj1 face\$) and condition\$.ab.	0	<u>L1</u>

END OF SEARCH HISTORY

update

Freeform Search

Happy face

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Term: (computer same (display\$ with (happy adj1 face\$) and condition\$))

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<u>L4</u>	(computer same (display\$ with (happy adj1 face\$) and condition\$))	4	<u>L4</u>
<u>L3</u>	(computer with display\$ with (happy adj1 face\$) and condition\$)	1	<u>L3</u>
<u>L2</u>	(computer and display\$ and (happy adj1 face\$) and condition\$)	35	<u>L2</u>
<u>L1</u>	(computer and display\$ and (happy adj1 face\$) and condition\$).ab.	0	<u>L1</u>

END OF SEARCH HISTORY

5,974,262
L3

First Hit Fwd Refs☐ **Generate Collection**

L3: Entry 1 of 1

File: USPT

Oct 26, 1999

DOCUMENT-IDENTIFIER: US 5974262 A

TITLE: System for generating output based on involuntary and voluntary user input without providing output information to induce user to alter involuntary input

Abstract Text (1):

An interactive computer system responsive to a user's voluntary and autonomic nervous system responses. The interactive computer system includes a computer, a voluntary input device requiring intentional actuation by the use, a sensor to detect autonomic nervous system responses, an interface device, and an output device. The voluntary input devices and output devices communicate with the computer. The sensors detect autonomic nervous system signals of a user and generate signals representative of the responses. The interface device communicates with the sensors and the computer. The interface device conditions the signals generated by the sensors and transmits the signals to the computer. The computer is responsive to the signals and produces an output command which is in part dependent upon the signals. The output device responds appropriately to the output command produced by the computer.

Brief Summary Text (20):

Computers have been used to collect data about the autonomic responses of a subject in the context of medical monitoring and treatment. In U.S. Pat. No. 5,441,047, an ambulatory patient health monitoring system is disclosed where a patient is monitored by a health care worker at a central station while the patient is at a remote location. Various items of medical condition sensing and monitoring equipment are placed in the patient's home, depending on the particular medical needs of the patient. The patient's medical condition is sensed and measured in the home, and the data are collected by a computer and transmitted to the central station for analysis and display. The health care worker then is placed into interactive visual communication with the patient so that the health care worker can assess the patient's general well being as well as the patient's medical condition.

Detailed Description Text (5):

Sensors 26, 28, 30, and 32 detect autonomic nervous system responses of a user, such as the user's heart rate, galvanic skin resistance, blood pressure, and respiration, respectively, and generate outputs which are signals representative of a physiological or emotional condition of the user. Sensors to detect other autonomic nervous system responses may also be used. As long as at least one physiological or emotional condition is detected, any number and variety of autonomic nervous system sensors may be used. For example, one embodiment of the invention might use a blood pressure sensor and a respiration sensor together to detect the emotion fear.

Detailed Description Text (7):

Referring again to FIG. 1, the invention further comprises an interface device 24. The interface device 24, which can be located within or outside of computer 12, communicates with the computer 12 and the sensors 26, 28, 30, and 32. The sensors 26, 28, 30, and 32 generate and transmit signals which are representative of the detected autonomic nervous system signals. The interface device 24 receives and conditions the signals from the sensors 26, 28, 30, and 32 to signals suitable for

computer 12. The conditioning of the signals may consist of amplifying, filtering, and converting analog signals to digital signals. In the embodiment in FIG. 1, the interface 24 receives analog signals from sensors 26, 28, 30, and 32 and amplifies, filters, and converts the analog signals to digital signals. The digital signals are then transmitted by interface device 24 to computer 12.

Detailed Description Text (16):

One possible embodiment of interface device 24 is illustrated in FIG. 5. Transducer inputs 100, 102, and 104 receive the analog signals from the autonomic nervous system sensors. Interface device 24 may, of course, have any number and variety of transducer inputs, and is not limited to three inputs. Analog signal conditioner 106 amplifies and filters the analog signals received by transducer inputs 100, 102, and 104. Microcontroller 108 receives the amplified and filtered analog signals from analog signal conditioner 106 and converts the analog signals to digital signals. RC oscillator 110 controls the timing of microcontroller 108. After the analog signals are converted to digital signals, microcontroller 108 transmits the digital signals to the computer via octal switch 116 and parallel port 118, which is connected to the computer 12.

Detailed Description Text (25):

For example, assume a first user operating computer 202 is communicating with a second user operating computer 232 in a "chat room" session. When computer 202, based on the responses from the sensors 216 and 218, detects that the first user is happy, computer 202 may send to computer 232 an output command to display a happy face on the second user's screen. If the first user is experiencing acute stress, computer 202 may instruct computer 232 to activate the pressure applying device in input-output device 246.

CLAIMS:

29. A combination input-output device for an interactive computer system comprising:

a holder for interfacing with an anatomical part of the body of a user;

a plurality of electrodes located on the holder and bridged by the user's body so that the user's body contacts the electrodes, the electrodes being selectively connectable to a first circuit for measuring a first physiological condition of the user and being selectively connectable to a second circuit for causing a first physiological sensation in the user;

a mechanical device connected to the holder for sensing a second physiological condition of the user and for causing a second physiological sensation in the user.



US005974262A

United States Patent [19]

Fuller et al.

[11] Patent Number: **5,974,262**[45] Date of Patent: **Oct. 26, 1999**

[54] **SYSTEM FOR GENERATING OUTPUT
BASED ON INVOLUNTARY AND
VOLUNTARY USER INPUT WITHOUT
PROVIDING OUTPUT INFORMATION TO
INDUCE USER TO ALTER INVOLUNTARY
INPUT**

[75] Inventors: **Terry A. Fuller, Rydal; Aarne H.
Reid, Meadowbrook, both of Pa.**

[73] Assignee: **Fuller Research Corporation, Rydal,
Pa.**

[21] Appl. No.: **08/911,752**

[22] Filed: **Aug. 15, 1997**

[51] Int. Cl.⁶ **G06F 13/38**

[52] U.S. Cl. **395/838; 600/425; 600/301;
600/545; 600/546; 395/500; 395/835**

[58] Field of Search **600/301, 425,
600/545, 546, 587; 364/578; 395/500, 838,
835**

[56] **References Cited**

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Primary Examiner—Thomas C. Lee

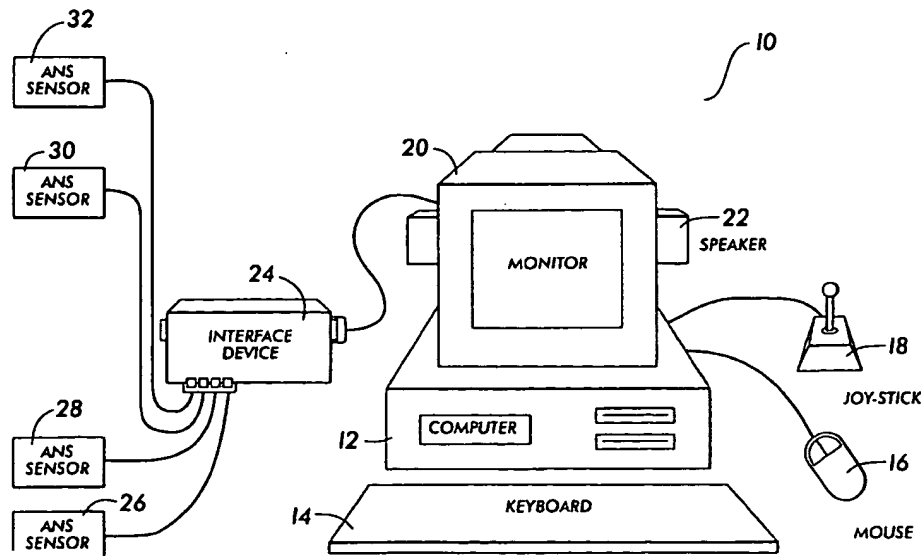
Assistant Examiner—Michael G. Smith

Attorney, Agent, or Firm—Seidel, Gonda, Lavorgna &
Monaco, PC

[57] **ABSTRACT**

An interactive computer system responsive to a user's voluntary and autonomic nervous system responses. The interactive computer system includes a computer, a voluntary input device requiring intentional actuation by the user, a sensor to detect autonomic nervous system responses, an interface device, and an output device. The voluntary input devices and output devices communicate with the computer. The sensors detect autonomic nervous system signals of a user and generate signals representative of the responses. The interface device communicates with the sensors and the computer. The interface device conditions the signals generated by the sensors and transmits the signals to the computer. The computer is responsive to the signals and produces an output command which is in part dependent upon the signals. The output device responds appropriately to the output command produced by the computer.

33 Claims, 7 Drawing Sheets



Refine Search

Search Results -

Term	Documents
HANDHELD	9787
HANDHELDS	70
PORTABLE	141149
PORTABLES	546
HAPPY	2410
HAPPIES	3
HAPPYS	0
DISPLAY\$	0
DISPLAY	395986
DISPLAYA	9
DISPLAYABEL	1
((HANDHELD OR PORTABLE).AB. AND (DISPLAY\$ WITH HAPPY WITH FACE\$)).USPT.	6

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